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## hESC-derived photoreceptors survive and integrate better in immunodeficient retina.

Journal:	Stem Cell Investig
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### Public Summary:

This editorial discussed the article of Zhu J, Cifuentes H, Reynolds J, et al. Immunosuppression via Loss of IL2 $\gamma$  Enhances Long-Term Functional Integration of hESC-Derived Photoreceptors in the Mouse Retina. Cell Stem Cell 2017;20:374-84.e5. Zhu et al. had created an immunodeficient mouse model (removal of the factor IL2 $\gamma$ -gamma) and crossed it with a mouse strain with retinal degeneration, lacking the CRX protein. They injected dissociated retinal progenitor cells that were derived from human embryonic stem cells and labeled to express green fluorescent protein, to the subretinal space of immunodeficient and immunocompetent mice with and without retinal degeneration. Their data showed that transplanted cells survived for up to 9 months in the immunodeficient mice with retinal degeneration whereas very few cells survived in immunocompetent mice at 3 months. Transplanted immunodeficient retinal degenerate mice showed a pupillary reflex up to 9 months after transplantation. In a few tested animals, electrophysiological recordings from the eyes (electroretinograms) showed very small responses that were absent in sham surgeries. In addition, the authors showed that exposing anesthetized immunodeficient retinal degenerate mice with transplants to very strong light for 2 hours after overnight dark adaptation, induced expression of "immediate early" genes in visual brain centers that were not seen in retinal degenerate controls. The study by Zhu et al. confirms that immunodeficient animal models are better for transplant survival and integration than models that need immunosuppression by drugs because of the side effects of immunosuppressant drugs. It is unclear however, how this would translate to future clinical trials. In a previous clinical trial with fetal retina-RPE sheet transplants to patients with retinitis pigmentosa and AMD, no immunosuppression was used, and transplants survived for many years.

### Scientific Abstract:

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